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AUTHOR Jones, E. I.
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ABSTRACT

In developing countries, the demand for educational dollars is greater than the supply. Priorities must be selected for open higher education in both methods and subject matter. Developing countries should give a higher priority to vocational education. Since well before World War II, distance education has been available in New Zealand. Successive governments have taken the view that no matter where a student lives he/she is entitled to equal opportunities for education at all levels. At New Zealand Technical Correspondence Institute (TCI), the largest element of growth of open higher vocational education has been the development of technician courses. Because of the increasing demand for TCI to offer courses that require a measure of hands-on experience, students must attend a block course. Quality controls on the final product are exercised by limiting enrollment at TCI to those employed in or expecting to enter a particular job or occupation. The principal educational media are the written and printed word. Study programs, called assignments, are supplemented with audiotapes. The lack of a national educational strategy is unfortunate in view of the benefits to developing nations with open higher distance education and its importance in the future. (Appended materials include outlines of courses and modules and information concerning the Technicians Certification Authority.) (YLB)

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OPEN HIGHER VOCATIONAL EDUCATION IN NEW ZEALAND

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OPEN HIGHER VOCATIONAL EDUCATION IN NEW ZEALAND

— Evan I. Jones

1. GENERAL REVIEW OF OPEN HIGHER EDUCATION

This paper is intended to take into account the real needs of developing countries and their resources available for open higher education. Vocational education and training are pressing needs, if the gap between the standards of living of the developed countries and developing countries is to be reduced.

We are members of the International Council for Distance Education (I.C.D.E.). Its Bulletin does not fully reflect the massive problems faced by developing countries. Instead, it concentrates on such matters as the use of electronic media, the cost effectiveness of which has not, in most cases, been thoroughly evaluated.

It is clear that distance (open) education — particularly at the higher level — will expand even more rapidly than the dramatic increase during the last few years. The so-called developed countries — particularly those which have recently entered the field — tend to rely on the latest electronically based technology, perhaps to cover up their lack of experience of distance education, and also because money is readily available. "However, an unsound educational structure cannot be improved merely by applying modern educational technologies. They merely paper over the cracks[1]."

Bååth[2] has put his finger on the pulse of Open Higher Education. He quotes Rumble and Keagan[3] to indicate, "I am convinced, that this is a general playing down of the value of correspondence teaching and the use of print".

Bååth hopes I.C.D.E. will get "a good representation also from the non-university people and if we manage to arrange favourable conditions for an open exchange of information, and for constructive discussion, I am convinced that we will all have much to gain". Our philosophy of higher distance education is akin to that of Bååth.

Unfortunately, many developing countries cannot afford to emulate the Open University and its counterparts elsewhere. The increasing use of electronic technology in these institutes may prove to be more effective than more conventional distance education methods, but there is no doubt that costs to both governments and students have escalated. The Open University, for example, has had to accept financial restraints and student fees have increased considerably.

In countries, such as New Zealand, the demand for educational dollars is greater than the supply and we must select priorities for open higher education in both methods and subject matter.

At the risk of offending the Arts buffs, it is clear to me that priorities are needed, when educational finance is in short supply; increasing food production, for example, is a pressing need.

That means vocational education and training must be stepped up.

I am convinced that developing countries should give a higher priority to vocational education. Open higher vocational education is a valuable means by which, in the case of TCI, subject ranging from skilled trades through technician to post-graduate level vocational education can be taught effectively.

2. WHAT IS OPEN HIGHER EDUCATION?

In New Zealand, we have accepted that education should be open to all, regardless of financial status or location. Distance education has been, since well before World War 2, available for those who, for whatever reasons, cannot attend classes. In New Zealand, "higher" means any course at tertiary level — that is post-secondary school level.

3. A BRIEF HISTORY OF DISTANCE EDUCATION IN NEW ZEALAND

My country has been a pioneer of distance education which has been government funded from its beginning.

The Correspondence School was established in 1926 to ensure that children and young people living in rural areas received an equal standard of education to those in cities.

The Technical Correspondence Institute (TCI) was established in 1946, to ensure that ex-servicemen could enter vocations — mainly at skilled trades and sub-technician levels.

Massey University extra-mural studies department catered originally for teachers wishing to study for extra teaching qualifications, (now C.U.E.S.).

In all cases, because of the quality of courses, all have developed and grown in popularity. Student rolls have increased such that, for example, my Institute's roll has increased from 614 students in 1946 to 28 600 in 1984. From a staff of 8, it now has a total staff of 500 tutors and administration staff.

4. REASONS FOR THE DEVELOPMENT AND EXPANSION OF DISTANCE EDUCATION IN NEW ZEALAND

- Successive Governments have taken the view that no matter where a student lives he/she is entitled to equal opportunities for education at all levels.

- This includes people whose jobs or personal circumstances do not allow them to attend face-to-face lectures or classes.

- Money has always been made available to ensure that first-class distance education courses are well-written, educationally sound and attractively presented.

- Some countries use many 'outside markers' and course writers who are not trained, not dedicated, and not well paid. We are staffed, in the main by full-time teachers or tutors.

- There is at TCI and the Correspondence School little use of staff having to teach a combination of part-time face-to-face, part-time distance, education teaching. This is an educational trap into which even some affluent countries have fallen.

- By sympathetic tuition from teachers or tutors, a one-to-one situation is created on a personal basis.

- Pass rates in externally set and marked examinations are as high as, or better than, the national average.

- (a) The Correspondence School does not charge fees.

  (b) Massey University and TCI fees, are by any standard in the world, minimal.

- The Correspondence School produces excellent radio programmes for its students.

- Massey uses seminars and area groups very effectively.

- The Correspondence School uses area peripatetic teachers to visit and coach its students.

- Students — certainly at TCI — can study at their own pace, commensurate with their ability and time available to them.

- New Zealand distance education establishments have not rushed in to use the latest technology without having it, in all its forms, evaluated. Does anyone else remember the fiasco of programmed learning?

- We are convinced that the written word is still a most powerful medium.

- We are not educating a rich élite. Thus, we do not insist "You must have your own computer, V.T.R. — even a telephone — before you enrol with us".

5. THE DEVELOPMENT OF NZTCI

As stated earlier, student enrolments have increased from 614 to 28 600, in 38 years, yet our human population has not increased dramatically.

In 1946, TCI (then the T.C. School) offered largely trade courses, but with low level technician basic subjects also — mathematics and physics. Twelve such courses[4] were offered. There are now 940 subjects available[5]. In June 1982, 29 837 students had enrolled[6].

Perhaps the largest single element of the growth of TCI's open higher vocational education has been, in common with our face-to-face colleagues, the development of technician courses. Seen as a bridge between the skilled 'trades' person and the technology oriented university graduate, technicians and courses related to their employment have been most successful. Annex 2 gives an outline of A.A.V.A. and some of its rules, strengths, and weaknesses.

This area of study has, if banking, tourism et al courses are considered as technician level, grown to such an extent that our open higher vocational courses now comprise about 65% of all enrolments.

A very important aspect is that if, say, an engineering technician student passes the final level external examination with high grades, after completing a few more subjects, that student can receive a credit of two years' study towards a 4 year university degree course — a powerful incentive.

A section of TCI's prospectus will, no doubt, indicate how the number of TCI's courses has increased, based on demand. (See Annex 1.)

It is noteworthy that UK is to start an Open College to cater for technicians. Indicative of the development of TCI and the quality of its courses are the requests for our course material (assignments) from other countries. We have supplied courses to Australian States, Singapore, and several other countries.

6. DEVELOPMENTS AND CHANGES OF PHILOSOPHY

Because of the increasing requirements for TCI to offer courses which required a measure of 'hands on' experience, our courses required an additional component. In co-operation with our face-to-face technical institutes and community colleges, and with assistance from our Labour Department and employers, those courses that require a 'hands on' content make it mandatory for students to attend a block course — from 1 week per subject to 18 weeks during the early stages of the course. The teaching of theory, reinforced by practical experience produces a well-rounded student/trainee.

New Zealanders have always been self reliant, with an emphasis on not just a 'higher education' piece of paper, but an ability to do the job yourself or to understand what others

must be able to do. Even our university graduates are, in many disciplines, required to have proved that they have had suitable complementary practical training before they receive their degree.

Clearly, there is a limit to what can be taught at a distance. Hands-on experience cannot, of course, be replaced by video-taped training programmes. TCI does not claim to be able to do everything in the education-training fields.

We cannot teach, nor do we claim to teach, every skill to our students. We do claim that, in the main, they are educated and trained to a high standard by integrating theory and practical education and training.

Over the years since open higher vocational distance education has established itself — not as a second best option — quality controls on the final product have been exercised.

- In the majority of courses, no student may enrol with us unless actually employed in a particular job or occupation.

- No student can enrol unless it can be proved that he/she is either employed in, or expects to enter a particular job or occupation.

Obviously this rule restricts our enrolments which, if a 'free for all' situation was allowed, would increase our roll to more than 100 000 students.

The opportunity to study with TCI is thus restricted. The rules do, however, eliminate the 'paper only' theorists who can only pass examinations.

Unfortunately, now New Zealand's unemployment figures have risen, the rules exclude those who may otherwise prepare themselves better for employment opportunities that may arise for them in the future.

7. POLICIES AND PRESENT METHODS OF DISTANCE VOCATIONAL EDUCATION AT NZTCI

The written and printed word are still our main educational media. Our study programmes are called assignments.

Assignments, especially our various English language courses, are supplemented with Audio Tapes. (A survey indicated that 96% of our students had access to audio recorder-players.)

We tried to complement our assignments with video tapes. However, we soon found that very few students had access to VTRs. Those few who did have access to them were not able to see and hear the tapes just before, or soon after, studying an assignment — an educational disaster. So, until it is possible for our students to have ready access — by either renting or purchasing VTRs, we are not making wide use of video tapes. I have mentioned earlier that my country is not interested in educating only those who can afford very high course fees, computers, and VTRs. A rich educated élite is not our goal. Neither do we expect students, as in the USA and Canada, for example, to get into debt to "finance themselves through college".

Because successive governments have subscribed to educational egalitariansm, our fees for an academic year, with three subjects are $55 — about US$25.

Our courses are developed from two main sources:

1. By developing into educational form externally drawn up syllabuses, or

2. By consultation with an employer group or industry training board to draw up a suitable syllabus.

8. STEPS IN CURRICULUM DEVELOPMENT

A subject specialist is selected to write the assignment. This is a full-time tutor with suitable industrial/commercial and curriculum development experience.

The technical editor is selected to check the accuracy of the course material. A recent innovation is that, before our assignments are printed, an employer group or training board nominates an expert to edit them, and confirm the relevance and quality of subject content.

The Head of Department, after selecting the two people above, calls meetings with a subject (course) supervisor, the above and, where necessary, other expert writers and any other advisers he requires.

The syllabus is broken down into watertight modular topics (assignments), usually 10, and a content plan is drawn up and submitted to the Deputy Principal. He discusses the objectives with the subjects specialist and if satisfactory, approves the content plan.

Once having obtained clearance on objectives and content, the subject specialist (author) writes the first draft of the assignment.

Self-checking practice exercises are included in each assignment where key learning points are made. Summaries are also used to highlight important "points to remember".

Test questions for the student are provided at the end of the assignment.

Illustrations to be used are discussed with an Art Editor. (Artists are employed to produce illustrations.) If Audio-Visual material is required, an audio-visual producer is consulted on the script emphasis required and the subject specialist joins the producer to make the A-V aid.

All draft assignments are technically edited then checked for a simple and logical development of the topic. Following approval, English is checked for correctness and simplicity and educational merit by presentation editors, who also check the layout.

Assignments are then typed, illustrated and printed.

When the student receives his assignment, he reads it, completes the exercises, and then returns the completed test paper to his tutor for assessment and comment.

After students send in their work it is assessed, commented on and returned to the student with the next assignment and specimen answers for the marked assignment.

9. EVALUATION AND RESEARCH

Until recently, the sole evaluation criteria used were complaints by students or external examination pass rates.

These were thought, during the last 3 years, to be an insufficient guide to the real success or weaknesses of our course programmes.

First, we called in the New Zealand Council for Educational Research to evaluate the reading levels of our courses.[7]

The results shook our complacency.

The readability research, which we initiated, has now been taken up by Massey University.

A more recent NZCER - TCI joint research programme has revealed some thought-provoking problems related to certain of our management courses. Before the final results of the research are completed, we realise we must think again — especially when the age of students is in the 20 to 45 age range.

10. EXTERNAL STANDARDS MET — SYLLABUSES AND EXAMINATIONS

TCI has very little say in the drafting of externally examined syllabuses. Even if they are out of date or have out of date or irrelevant material included, we must still write our courses around them. Nevertheless, despite the frustrations which our tutors face regarding syllabus content, most of our students are pleased with what we offer.

It must be remembered that, unlike the face-to-face situation, all of our course material is subject to the critical scrutiny not only of our students, but also of their parents, friends, and employers. These checks are invaluable to us, because the feedback, though not always complimentary, keeps us on our toes and indicates to our tutors where improvements in presentation and subject material must be made.

As mentioned earlier, our externally set and marked examinations indicate that we are at least as good as our face-to-face counterparts.

11. LIMITATIONS OF PRESENT METHODS

We have perceived limitations in our courses. We cannot offer as much 'hands on' experience to students as we would like.

Although we attempt to recruit tutors who can be trained to be expert educational course writers, this is not always possible. Even though we use technical editors to check the accuracy and relevance of the subject matter, and presentation editors to check and improve the layout and presentation, they often still contain irrelevant or outdated material.

Some of our tutors produce factually correct, but boring, course materials. Others are, frankly, longwinded.

Not all of our assignments are truly self-contained modules, and some are not educationally well thought out.

By the same token, however, some of our tutors do write superbly clear, educationally sound, and highly interesting assignments.

We are, perhaps, overly dictated to by externally devised curricula (syllabuses). To be fair, at least these are nationally prescribed syllabuses, and a national standard is maintained. Any student who is successful has a nationally recognised qualification.

We do not have liaison tutors who, like the Correspondence School, can assist, on a peripatetic basis, individual students.

For certain courses there are no pre-entry qualifications or, if there are, employers can still override prerequisites. To illustrate this point, we enrolled, on an employer's advice, a student for Horticulture who could not read! Yet the individual would be expected to use lethal pesticides.

Readability is still a serious problem, as are students' reading levels.

12. TUTOR TRAINING

We are hoping, soon, to offer 3 months' tutor training to all tutors — commencing with new entrants — see Annex 3. This, we hope, will improve the educational quality of our assignments.

This is a high priority for TCI because, although we have been giving tutor training in the past, we have not been happy with the length of time allocated, nor with the minimum emphasis on training for teachers in distance education.

Having recognised a severe weakness in our tutor training methods, we shall try out the programme mentioned, then have it evaluated by an external organisation — NZCER or Victoria University's education faculty.

Our Director-General of Education, W.L. Renwick[8], drew the attention of our tutors' union (ATTI) to the general weakness in tutor training and resource development, in 1982.

13. RESTRICTIONS ON ENROLMENTS

Except for the employment related restrictions mentioned earlier, there has been no definitive restriction on enrolments in TCI. However, because tutorial and administration staff have been subjected to staff ceilings, we have been faced with either restricting enrolments or taking longer to return students' test papers without reducing our standards of tuition. We have chosen the latter course.

However, a major weakness of TCI's education method is that, when students have a problem with a particular aspect or principle, by the time they send in their test papers and have them returned and their mistakes pointed out, 2 or 3 weeks often passes. Students can phone in, but a problem with, say, integral calculus, is difficult to explain satisfactorily over the phone. In this respect, restrictions on staff mean, not only that students' educational development is affected, but also that the quality of our service to the students is undermined.

14. THE LACK OF AN EDUCATIONAL STRATEGY — ITS EFFECTS

It is unfortunate that within our Department of Education — and I suspect it is the case in other countries — there is nobody in a senior post who has been involved with open higher vocational education.

Moreover, it has been made clear to those of us who are in the distance open higher vocational scene, that we are considered as the second best and consequently have been relegated to the reserves. Statistics related to the growth of distance open vocational education make nonsense of these views.

What are the options, best to spend a New Zealand vocational education dollar? We are, in all New Zealand educational circles, being subjected to financial constraints, — understandable, because our economy is not as buoyant as during the 60's.

There is, certainly in the higher vocational education sense, an almost total lack of strategy, as opposed to expedient tactics.

It is suggested that the failure rate in face-to-face institutes could be reduced considerably if more students were required to undertake a preliminary open (distance) education course before attending a face-to-face institute — at considerable expense to our nation.

The suggestion continues that those not willing to undertake the discipline of distance vocational programmes would change their minds before embarking on a vocational course for which they were not suited.

Benefits to Developing Nations of Open Higher Distance Education

Given reasonable student numbers, open higher distance vocational education is up to 30% cheaper than the face-to-face situation. Even so, the initial costs of setting up a distance education course are considerable. It is conceded that, to provide a worthwhile distance vocational course, student numbers should justify the large initial costs.

If there is a priority in national economy terms, small-number courses should be offered at a regional, or national centre, on a sandwich or short block course basis.

To obtain the most cost-education effective use of money available for higher education, developing countries should compare, carefully, the advantages of open higher distance vocational education versus face-to-face teaching. When, as is the case, developing countries have very large numbers of

people requiring vocational education and training, the 'open' distance method is, within limits described earlier, superior, and

- More cost and educationally effective,
- More readily checked for standards and quality,
- Able to educate a very large number of people for vocations quickly and effectively. Changes in technology can be communicated much more readily than by retraining teachers (tutors) in main centres.

Through distance education, teachers themselves can be, if not too far out of date, upgraded by studying for open higher vocational education qualifications. Indeed, this method is much more cost effective, providing course material is kept up-to-date, than any other educational method.

Above all, cherish your open higher (distance) education teachers and convince them — by encouraging them — that their expertise is worthwhile and is contributing to your educational and economic goals.

Develop a national higher vocational education system, based on a planned strategy to make the best use of your financial resources. Never underestimate the value, as is the case in higher education circles in New Zealand, of open distance vocational education.

Specify what you mean by Higher Education. It does not mean, I believe, copying such as the Open University. Develop your own methods. Costs, of course, have escalated and the UK Government has acted to restrain costs.

15. COSTS INVOLVED AND THE EFFECTIVENESS OF THE UP-TO-DATE SOPHISTICATED TECHNOLOGIES.

First, most developing countries cannot afford to purchase, so as to benefit a wide cross-section of their peoples the latest and sophisticated technology for educational purposes.

Secondly, they are often merely keeping up with the Jones's by using what they cannot afford to offer, on a wide basis, to all of the members of their educational communities.

No developed country has yet been able to fully determine the educational benefits by evaluating the new technologies before willy-nilly adopting them.

Let us examine them, within what is possible and reasonable for cost-benefit educational effectiveness.

Television

Many developing countries now have television available, although not every student has access to a T.V. set.

Nevertheless, T.V. has a place — provided it is used to complement other educational material.

- Programmes should be produced with appeal, based on sound educational psychology, and suited to the particular education level of the viewers.

- Reception must be good. Satellites in widely dispersed countries such as Indonesia are expensive but invaluable.

Radio

This medium is most effective for language courses because it is readily available to students and is relatively inexpensive. Ideally, students should be able to record the programmes.

Our Correspondence School has many years of expertise in this medium.

Telephone Network (E.T.N.)

This system is good in affluent developed countries, but is costly on staff time. If the user pays toll calls in developing countries, costs would prohibit students using it.

VTR's

Probably the most significant development in distance education, VTRs linked with TV, will prove their educational value. Play-back facility is educationally sound. However, how many developing countries students can afford VTRs?

Teletext — See my comments on TV and VTRs.

Telematics

These may prove to be a useful educational tool for affluent developed countries whose students can afford "a 64K computer for about A$800..."[9].

The above review is not exhaustive. It is intended to focus attention on criteria such as

- The cost-educational effectiveness of the new technologies. None has been fully evaluated as yet. The claim that TV in the classroom would replace teachers appears to have faded away.

- How many developing countries can afford new technology unless only an élite group is to be educated?

- The educational philosophy of any country. New Zealand has, since its earliest days, concentrated on a sound education for all, with fees, if charged, being minimal.

Within the limitations I have described above, correspondence education at a distance is, still, fundamentally sound — even for higher vocational education.

16. THE FUTURE OF OPEN HIGHER DISTANCE EDUCATION

All forms of distance education will be more important in the future. The increasing importance of pre-vocational skills and education has been recognised in certain developing countries (Fiji and Indonesia are two examples).

How can these goals be achieved? How can the developing countries, within severe financial constraints, achieve a higher standard of practical technology? More basically, can they afford not to?

- Teacher/tutor training methods must be improved.

- One method of improving training is to use part distance, part 'on the job' training for teachers of vocational subjects — This will reduce training costs and allow a shorter training time.

- Teachers must produce resource material for themselves and their students. Standards of teaching will increase at less cost. Distance educators can produce this resource material in the form of teachers notes, students notes, simple visual aids, tests, evaluation techniques, and so on. TV, radio, and the use of satellites can make an impact by complementing what is taught.

- Developing countries will need to make available a central source to write and produce — even print — correspondence courses.

- A network of teachers/tutors will be required in regional centres to distribute material, mark, and give tuition to their students.

- In remoter regions, vocational students will need to come in for practical training — after they have successfully completed a correspondence course. They will receive some revision of theory then be instructed and tested on all aspects of their course — theory and practical. National, external examinations and practical tests must be monitored.

- Those who are to write and produce open higher vocational education training courses must themselves be trained. Retraining — updating teachers/tutors educational skills can best be implemented by correspondence — block course — methods.

Open higher vocational education is an essential ingredient of any developing country's economic and social goals!

You will note that I have left out use of some of the 'new technologies'. By all means developing countries should try them out on a pilot basis, then stringently evaluate them on a cost-educational benefit basis. Fundamentally, it is important to equate educational opportunity with available financial resources.

17. SUMMARY

I have placed the most emphasis on open higher education:

- On usefulness for developing countries
- Open vocational education, and complementary training
- Cost-effectiveness relative to those whose 'educational dollar' is not too readily available
- Some pragmatic thoughts about the 'new technologies'
- On the fact that we, in New Zealand, are speaking not as "instant experts", but with several decades of experience behind us in the field of higher vocational distance education.

- On open higher education being open to all and not being restricted only to those students who can afford to pay for high technology experiments.

I am convinced that the affluent developed countries will continue to try to develop a respectability for open higher education by introducing more and more technology-based courses. These aids cannot, of course, replace educational expertise!

Nevertheless, provided money is available and, as important, expertise in distance education techniques is acquired, open higher education will be more oriented towards learning in your own home. The 'friendly' computer may replace the rapport built up between sympathetic tutors and their students of distance education.

Nevertheless, with all the faults of open higher vocational distance education at TCI as have been described, we still prefer, with logical, reasonable costs, our correspondence course style — until proven application of the 'new technologies' is thoroughly evaluated.

Both my Principal and myself, on behalf of TCI, should be pleased to continue assistance to developing countries — better to produce cost-educational effective methods of distance education.

We have, even if only through our mistakes, learned much of value, during 38 years, that we would be glad to share with our less well-endowed developing country friends.

CONCLUDING COMMENTS

1. I wish to thank the Ramkhamhaeng University for its generosity to me.

2. I hope my paper meets their expectations.

3. The paper is intended to be mildly controversial, but its real intent is to expose certain myths that the affluent, developed countries sometimes perpetrate in higher education.

   It is intended also to promote a sense of realism for developing countries which, although sending delegates for open higher education, all too often acquiesce about the use of the new technologies.

   In practice - you, the developing countries cannot afford their general use, that is, unless you are merely educating an elite on a restricted basis.

4. I have attempted to give an honest picture of the perceived strengths and weaknesses of open higher vocational distance education at TCI.

5. We are still proud of, and cling to an egalitarian philosophy towards education.

6. We need more research, but see Reference 1, not from those who themselves have no experience of open distance education, but wish too often to undertake the research to obtain a Ph.D.

7. We are not "merely papering over the cracks with the new technologies".

8. We are not uncritical of our own Department of Education nor of our A.A.V.A. (formerly T.C.A.).

9. We are instituting distance education tutor training programmes. We shall have them evaluated independently of TCI.

10. We do not accept that our open higher vocational distance education at TCI is, on its own, the last word. I have indicated this, together with some New Zealand solutions.

11. My colleague, the Principal, was amazed recently, when in Jakarta, that the D.G. of Higher Education there had never heard of TCI! He had heard of and read about the Open University. Why? Perhaps we in New Zealand have been too modest about our achievements and growth (increase in enrolments) during 38 years in the field.

    When I return, I shall ask my Principal that we write articles suitable for I.C.D.E. Bulletins, and targeted to the developing countries.

12. We have already hosted distance teachers/administrators from India, Singapore and Thailand. We shall welcome more, those from developing countries who wish to study our successful methods of open higher vocational education.

13. I must clear up one point. I am not, in any way, opposed to educating those interested in the Arts. We all need liberal thinkers, but developing countries need, also, for their scarce educational dollars those who can increase food and material production, utilise better their own work forces to replace imported products.

14. I shall welcome questions based on my paper and, hopefully, from those from the other open higher vocational education sector.

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ANNEX 2

NOTE: The Technicians Certification Authority has been renamed the Authority for Advanced Vocational Awards.

Over a period between 1945 and 1956 it had become evident in New Zealand that, in common with many other countries, there was a need for a group of people to fill the gap between the skilled craftsman (tradesman) and the technologist (university graduate).

The complexities of a trend towards increased local manufacture of consumer goods; the difficulties experienced by skilled tradesmen in linking up with the technologist's designs and philosophy; the misuse of university graduates in jobs underemploying their talents; the general shortage of both groups — these and many similar causes led to the requirement for the technician.

The Technicians Certification Authority (TCA) was established under the Technicians Certification Act in 1958.

Its functions are:

-- To prescribe courses and syllabuses; and to conduct examinations for technicians, and to appoint examiners, moderators, supervisors, and assessors for the purposes of those examinations;

-- To prescribe conditions for entry to such courses and to give exemptions where is considers it appropriate;

— To approve schools as suitable to conduct such courses,

— To grant or issue, either independently or in conjunction with any other examining body diplomas or certificates to any person in recognition of his having successfully completed a course prescribed under this Act.

For each area of study there is an Executive Committee consisting of representatives of the universities, professional institutions, e.g., The New Zealand Institute of Architects, the State Services, e.g., Ministry of Works and Development, Employers, the teaching institutions for technicians (technical institutes) and the Department of Education.

One representative of each Executive Committee is on the Authority Committee. The composition of the Authority, in 1975, was as given below. The members of the Authority are responsible for accepting new courses, prescribing the rules for all courses, and governing the standards for courses for technicians.

Chairman

Appointed by Minister of Education

Department of Education

Director of Continuing Education. Appointed by Minister of Education

Department of Education

Assistant Director of Continuing Education. Appointed by Minister of Education

Technical Institutes Association of New Zealand

Principal, Central Institute of Technology

Technical Institutes Association of New Zealand

Principal, Manakau Technical Institute

Vice Chancellor's Committee

Professor of Chemistry, University of Auckland

Representing Executive Committee for Engineering and Draughting

New Zealand Institute of Draughtsmen

Representing Executive Committee for Engineering and Draughting

New Zealand Institution of Engineers

Representing Executive Committee for Building

New Zealand Master Builders Federation

Representing Executive Committee for Building

New Zealand Institute of Architects

Representing Executive Committee for Science

New Zealand Institute of Chemistry

Representing Executive Committee for Science

New Zealand Institute of Medical Laboratory Technology Inc.

Representing Executive Committee for Commerce

State Services Commission

Representing Executive Committee for Commerce

Associated Chambers of Commerce

Each Executive Committee has the task of:

(a) deciding on course content — syllabus and curriculum. Outsiders can be co-opted to assist the development or revision of a syllabus

(b) putting together notes for the guidance of teachers, including any experimental work requirement, suitable reference books, length of time allocated to each topic

(c) whether any potential student is employed as a trainee technician. An important point is that the TCA will not accept as a student any person who, by the end of the third year (stage) level of a five year course, is not employed in the field of industry and/or commerce applicable to his study option. An example will illustrate this point.

A young man wishes to study for a New Zealand Certificate in Mechanical Engineering (NZCE). By the end of the third year study level he must be employed at least as a trainee mechanical engineering technician.

Moreover, before he is finally awarded his NZCE he must have had 3 years' experience as a technician (this includes training time).

(d) appointing examiners and moderators for internally and externally marked and assessed examinations

(e) recommending to the Authority final examination pass percentages.

The New Zealand Certificate Structure

The higher technician courses are of 5 years' duration for the student with no study exemptions. In each year of the course he must obtain

a coursemark from the institute where is is studying.

This coursemark has within it some or all of the following:

(a) satisfactory attendance (usually 75% minimum)

(b) a satisfactory home assignment mark

(c) a satisfactory laboratory course mark — his "lab book" must be available to TCA on demand

(d) a satisfactory mark for written tests undertaken during the course

Exemptions — are given for those with School Certificate (Year 1 exemptions) and University Entrance (Year 2 exemptions) and some trade and university study passes.

Thus a young person with suitable exemptions resulting from acceptable University Entrance Examinations may be exempted from almost all of the first two years (stages) of study (English is never exempted).

Those with considerable industrial experience may be exempted certain, restricted subjects. An example would be, say, a 28 year old draughtsman working in civil engineering. He could be exempted Engineering Drawing at Year 2 level.

Technical institutes approved to do so by TCA can internally examine all subjects for Years 1 and 2 and their passes are moderated by TCA.

They can use the same procedure for Year 4 subjects, but before examination papers and pass marks are accepted they are moderated by TCA (the Executive Committee appoints a moderator).

Years 3 and 5 have externally set and marked examinations, i.e., set and marked by TCA examiners.

NOTE each Stage is equivalent to a year's study.

A typical New Zealand Certificate course structure is given herewith.

New Zealand Certificate in Science

PARAMEDICAL

1. SUBJECTS OF THE FIRST TWO STAGES
SEVEN subjects required

COMPULSORY	English *Biology I and *II *Chemistry I and *II	Mathematics I
OPTIONAL (1 required)	Mathematics II *Physics I and *II	Drawing I *Mechanics I

2. SUBJECTS OF STAGES III, IV and V. No subject may be presented for examination until any prerequisites stipulated have been passed.

	SUBJECTS	PREREQUISITES
Stage III	+*Medical Biology	*Biology II
	+*Chemistry III	*Chemistry II
	and ONE of	
	+*Laboratory Technology (Medical)	Mathematics I
	*Physics III A	*Physics II
	*Physics III B	*Physics II
Stage IV	TWO of	
	+*Biochemistry I	*Chemistry III
	+*Medical Laboratory Practice I	*Medical Biology
	*Chemistry IV (A and B)	*Chemistry III *Physics II Mathematics II *Medical Biology and either
	*Human Physiology I (A and B)	*Physics III A or Physics III B
	*Instrumentation	*Physics II
	*Microbiology I	
Stage V	GROUP A	
	+*Medical Laboratory Practice 11A +*Medical Laboratory Practice 11B	*Medical Laboratory Practice I
	+*Medical Laboratory Practice 11C	*Biochemistry I
	+*Medical Laboratory Practice 11D	
	GROUP B	
	*Biochemistry II	
	*Medical Laboratory Practice 11C (Chemical Pathology) written and practical	*Biochemistry I and *Chemistry IV A *IV B
	GROUP C	
	*Human Physiology 11A *Human Physiology 11B *Human Physiology 11C *Human Physiology 11D	*Human Physiology IA, *IB and *Instrumentation

NOTE: Medical Laboratory Technology trainees are required to take the subjects marked + and Group A of the Fifth stage. They must also register with the Medical Laboratory Technologists Board which requires appropriate work experience in a recognised pathology laboratory.

3. Subjects marked * include a practical laboratory or field requirement.

4. For EXEMPTIONS for subjects of the first three stages see page .

5. Further details relating to the examination of Stages III, IV and V subjects of this certificate are given on pages and .

6. Students who are taking the Medical Laboratory Practice option (Group A) should note that the Medical Technologists Board has compiled in detail suitable work requirements which should be completed by every student.

The Courses: Their Relevance to Customers

The first higher technician courses were mainly in the engineering field — civil, electrical, mechanical production and telecommunications engineering and science chemistry, biology and physics.

The main sponsors initially were government departments — the Department of Scientific and Industrial Research (science options), Ministry of Works and Development (civil and mechanical options), New Zealand Electricity Department (electrical options), New Zealand Departments of Civil Aviation and Broadcasting (electronics and telecommunications) and a small number of private companies (production).

Thus the course requirements and syllabi tended to be oriented towards the education requirements of government departments. Similarly, the Authority tended to be largely representative of the government departments, the universities, such professional societies as the New Zealand Institution of Engineers and the Education Department.

Later, building, commerce, paramedical and similar groups requested that courses be set up for their technicians.

Private industry and commerce were late to take advantage of the technician courses offered and the effects of their action will be considered later.

The TCA now offers 16 major options for higher technicians in engineering, surveying, draughting, science, building, commerce, statistics, data processing, law, town planning, garage management, automotive, radio, telegraph and telephone, electrical, forest ranger and hospital work. (There are many more options now available — 1984.)

Within each option there are possibilities for a wide range of industry and commerce needs to be accommodated — see the paramedical option for a typical, flexible range of courses within an option.

Study Progression

It can be seen that a student can leave secondary school and with the right exemptions he can reduce a 5 year course to $2\frac{1}{2}$ to $3\frac{1}{2}$ years of study.

Equally a university student who drops out can, providing he has taken acceptable subjects (acceptable to TCA) be exempt up to and including year (Stage) 3 subjects.

Few skilled tradesmen obtain other than one or two exemptions should they wish to upgrade their education and status.

A student with a pass at Year 5 level *acceptable to a university can, for engineering, be exempt two years of a four year engineering degree. (*Extra subjects are now required.)

Strengths and Weaknesses of the New Zealand Certificate Courses

1. A major strength is that a technician who has started with few exemptions will have a good practical knowledge — gained by working and studying concurrently — of his field of endeavour.

   Thus, such an individual is able to act as a valuable bridging link between the skilled worker and the technologist. The best technicians, in this regard, are those who have studied part-time (usually day release nowadays) and been working the rest of the week.

2. A major weakness is that TCA has been pressurised into accepting full-time courses at technical institutes which enable a young person to leave secondary school and with a year full-time study clear up all subjects for Year 3 and part of Year 4 before having any experience of the field of his choice.

   Because such people are not necessarily sure that, say, production engineering is what they want to be in as a job, many square pegs for round holes are being produced. Employers, particularly private employers, are reluctant to employ these young people.

3. TCA is, see earlier comments, still largely dominated by the government departments who were its earliest customers. With the advent of Training Boards to look at the needs of their sectors of the work force, there is some disenchantment by private employers that their education requirements seem to take second place to different government department requirements.

The professional institutions, too, are considered to send often as representatives those who will safeguard the interests of their members rather than looking totally objectively at the needs of industry and commerce.

4. Because it is possible for students in certain options to proceed to university there is, still, perhaps, too much thought to constructing syllabi and curricula that maintain this progression even though only 10% of all successful NZ Certificate students take advantage of it. Many courses are considered to be too academic as a result.

5. External examinations do ensure national standards are maintained. They do not allow for the local, and sometimes, different requirements of government versus private industry or private industry in a farming area versus private industry in an industrial area to be met.

Perhaps internal assessment for all years of the courses could be undertaken with rigorous moderation procedures adopted to maintain standards.

6. Syllabus and curriculum committees are not considered, particularly by private industry, to be sufficiently representative. It is true that syllabi are circulated for comment, but the main voices considered are those of government departments and the technical institutes.

7. TCA is very moderately funded and this is perhaps the main factor giving rise to criticisms of courses which have proved to be invaluable to New Zealand's further industrial and commercial development.

8. The major strength of New Zealand Certificate courses is the insistence on working in the job for which a person is studying. Where, as described earlier, this rule has not been enforced due to giving way to pressure from educationalists, or due to lack of funds to police the rule not only the technicians themselves but New Zealand has suffered.

Developing countries which ignore the need for concurrent study and practical work do so at the risk of producing rather academically oriented technicians.

ANNEX 3

A DISTANCE EDUCATION TRAINING COURSE FOR TCI TUTORS

June 1984

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A Distance Education Course for TCI Tutors

Course Aims

Course Description

The Working Party Report

Appendix 1 The Basic Skills Course

Appendix 2 The Developmental Modules

Appendix 3 The Distance Education Projects

A DISTANCE EDUCATION COURSE FOR TCI TUTORS

The development of any training course for tutors at TCI must be seen as part of a more comprehensive staff development programme. Our staff training tutors, with support from selected tutors with specialist skills and experience in distance education, are preparing instructional modules on various aspects of distance education.

The course will consist of a series of modules — a module being defined as a self-contained instructional package based on one topic. Each module is divided into a set of units, each unit dealing with a specific aspect of the module topic. A feature of this modular design is that it can be used flexibly:

— Modules can be studied in sequence as part of a structured course. This is how new tutors will be trained.

— Modules can be studied singly, or in groups, by single tutors or small groups of tutors, as part of in-service training.

— Single modules or single units can be used as readings for seminars, workshops, and other forms of tutor refresher courses.

Each module will contain a brief introductory booklet outlining the content of the module, its teaching structure, its learning objectives, and how to study the module.

A study guide will be the central part of a unit. A study guide will consist of:

1. The learning objectives for the unit,
2. An outline of what the unit is about,
3. One or more readings or a tape to listen to,
4. The teaching material on the topic of the unit,
5. Self-testing exercises, and
6. A written assignment.

Each tutor will be expected to work through the unit largely on his own, but coached by the training staff or a specialist tutor whenever he needs it. In addition to the study guide work, each module will have an initial briefing session, each unit will include group discussion, and one-to-one tutor support will be available from the training staff and specialist tutors.

In preparing this course, we are choosing appropriate readings and other suitable materials such as examples from existing TCI assignments. These will enhance the credibility and standing of the course as well as making savings in writing and production time, and costs to our taxpayers.

The course will not be run entirely by specialist tutor training staff. It is intended to make use of the talents of existing tutors who have proven experience and are able practitioners of our distance mode of education. Being taught and coached by their peers will again improve the credibility and standing of the

course with tutors. It will reinforce the essential day-to-day training that new tutors get from their colleagues on the job.

Course Aims

The aims of the course planned for tutors are as follows:

1. To give tutors, as soon as possible, training in educational principles and in teaching techniques.
2. To help tutors make the change from being vocational practitioners to being vocational educators.
3. To encourage tutors to develop an attitude to our courses and students which will give them a clearer picture of their role as tutors.
4. To enable tutors to appreciate that distance education is a very effective form of instruction.

Course Description

Certain skills are all important such that every tutor must be given the chance to develop them. We shall cover these skills in a basic skills course that all new tutors will undertake.

Other skills are not needed by all tutors equally. For example, tutors solely marking students' scripts need different skills from those tutors involved with assignment writing. While

all tutors need a knowledge of the basics, they must be allowed to develop these skills, to a certain extent, in the direction of their choice whilst conforming to the needs of TCI. Tutors, like any other group, differ widely in their experience and ability. Therefore, after the basic skills course, we shall have available a series of modules from which a tutor will be given tuition, to suit TCI's, and his individual needs.

The course is based on a total study-time allowance of 12 weeks (400 hours), to be shared between TCI and the Wellington Regional Tutor Training Centre. A 3-stage training course is envisaged.

1. Basic Skills (5 weeks)

   See Appendix 4. This programme will consist of four compulsory modules:

   — The System of Distance Education — 40 hours
   — Two-way Communication in Distance Education — 40 hours
   — Objectives and Testing in Distance Education — 28 hours
   — Writing a Teaching Unit — 54 hours

   The programme will take 162 hours. Tutors are to complete this programme in their first year. Satisfactory completion may become a pre-requisite for appointment to the permanent staff. Much of what a tutor has to learn is learned on the job — for example, student enrolments, student records, production procedures, script handling systems, script marking, writing, and conditions of employment. *No system of tutor*

training can, by itself, train tutors thoroughly.

The help of fellow tutors in their day-to-day work is a form of continuous on-the-job training, particularly at TCI, where tutors are located in work-related groups.

The training course must be the real life situation and we are doing this by having much of this course prepared and managed by our proven superior tutors.

2. Developmental Skills (up to 5 weeks)

See Appendix 5. Training is designed to allow tutors to select modules which develop and extend the skills taught on the basic skills course. Tutors would normally do this stage in their second year. If a tutor is found to have difficulty or weakness in aspects of the basic skills course, he can go on to modules that go more fully into these aspects — for example, the fundamentals of clear writing.

In the second stage, tutors choose with advice 3 - 6 modules from a range of about 10 offered. Most of the modules need about 40 hours of study time. All are closely relevant to tutor development at TCI, and there is a pool of experienced, articulate people to teach the modules and revise and update them as required.

3. Distance Education Project or Special Methods (2 weeks)

See Appendix 6. We are sure that tutors will gain much by completing a project on a distance education topic in their third year.

The Working Party Report

The training scheme for new tutors accurately reflects the principles of training as required for all aspects of vocational education.

1. Have a clear and logical progression in training,
2. Match training with tutor work needs,
3. Be flexible and capable of adaptation and change,
4. Give priority where applicable and desirable to individual choice,
5. Give tutors access to a wide range of specialist staff, and
6. Lead on to further professional development.

Ideally, training in theory and practice should accompany, not precede, a tutor's practical experience on the job. Training should not be so compressed that it loses touch with the reality of teaching at a distance. For example, to develop as a competent writer of distance education teaching material, a tutor must progress through the theory and practice of writing, evaluating his printed work by means of the reactions and success of his students, and amending and revising his material to improve its teaching quality. In most cases this developmental process requires at least 3 years.

Our training staff have access to 400 experienced tutors, who have many and diverse skills in our mode of education — advising students, counselling, planning, researching, writing, editing, use of illustrations, typographic layout, and other skills peculiar to correspondence teaching. Tutors on a TCI course will have access to this expertise.

By the nature of correspondence work, tutors at TCI can be more easily released than tutors at other TIs to do training work. Therefore, we shall hold courses at times to suit groups of tutors and TCI's work patterns. We can also schedule these courses to give each tutor aspects of training when he/she needs it.

Although many of the principles of teaching and learning and many of the specific educational topics are the same at TCI and other TIs, the TCI course differs in *how these principles are applied and in the different emphasis given to them*.

We at TCI are very much aware of our tutors' individual needs.

We must develop their skills to the full, better to offer courses to our many students — our most important consideration.

APPENDIX 4

Outline of Modules and Units in the Basic Skills Programme

STAGE 1 (Compulsory 162 hours)

Module 1 Units 1 What is Distance Education?

2 Correspondence Teaching

3 Teaching and Learning

4 Organisation and Administration in Distance Education

Module 2 Two-way Communication in Distance Education (40 hours)

Units 1 The Function of Two-way Communication

2 Counselling Students at a Distance

3, 4 } Guiding Student Learning through Written Comments on Student Scripts

Module 3 Objectives and Testing (28 hours)

Units 1 Preparation of Instructional Objectives

2 Preparing Effective Test Questions

3 Preparation for Assessment

Module 4 Writing a Teaching Unit (54 hours)

Units 1 Training for Writing

2 Writing Clearly and Simply

3 Telling is not Teaching — factual information is not enough

4 Getting it Together — pre-planning

5 Getting it Down — in as few words as possible

6 Testing Procedures — including practice exercises

7 Evaluation — of students' responses and the assignment

APPENDIX 5

Outline of Module Contents of the Developmental Programme

STAGE 2 (Electives — up to 170 hours)

Tutors after counselling, will be guided to select a number of these modules — up to a maximum of 170 hours' study time. These electives must be completed before the end of a tutor's second year of employment. Module titles and an outline of their content are as follows.

Module 5 Teaching and Learning in Distance Education

This Module will benefit all tutors. It will examine the ways information can be structured for easy learning. It will also present ways for teaching concepts, principles, problem solving, and practical skills, at a distance. It will examine the ways adults learn, the function of memory, understanding of the learning process and correspondence tutoring, and the design of course materials.

Module 6 The Presentation of Teaching Materials (40 hours)

This Module will suit all tutors who wish to improve the teaching quality and impact of print materials. Some of the topics covered (see planning, sheet 6) will be

1. Improving the legibility of printed extracts by applying typographic principles;
2. Making more effective use of graphs, charts, and tables;
3. Ways to represent teaching content visually;
4. How to represent an illustrative idea to the illustrator;

5. Making the maximum use of existing illustrations;

6. The layout and sizing of illustrations;

7. Ways of linking illustrations to the text.

Module 7 Testing and Assessment (40 hours)

This Module will benefit all tutors. It will build on the foundation of Module 3 and look closely at the construction of test papers and objective test items (especially multiple choice). See Planning, sheet 7.

Module 8 Fundamentals of Clear Writing (20 hours)

This Module is designed to benefit authors who have specific weaknesses in writing, and who need extra training.

Module 9 Curriculum Development in Vocational Education (20 hours)

This Module will benefit tutors who will be expected to write course materials and/or who will become involved in syllabus development programmes. The principles of syllabus construction (setting objectives, selecting content, allocating study time, etc.) will be reviewed. Syllabus construction procedures of AAVA, TCB, and others would be briefly examined, and the role of the VPRU would be dealt with. Finally, the module will present guidelines to tutors on how to interpret existing syllabuses.

Module 10 Course Development in Distance Education (40 hours)

This Module is designed for those tutors involved in the development of new and/or revised courses.

It will examine

1. Alternative course development procedures,

2. Aspects of course design (when to use self-contained units, readings with study guides, remedial modules, optional units, audio tapes, and so on),

3. The construction of a course plan.

Module 11 Block Course Teaching (40 hours)

This Module is designed for TCI tutors who teach at block courses once or twice a year. They need training in some aspects of classroom management.

This Module covers

1. Lesson preparation based on five basic teaching principles about stating objectives, content structure, presentation, evaluation and learning;
2. Ways to motivate students;
3. The use of questions by tutors and how to handle students' questions and answers in the classroom;
4. The use of teaching aids, e.g. OHP, chalkboard, and so on; and
5. Points on speaking (delivery), e.g. use of notes, voice, manner, etc.

Other modules will be developed as required. Others being considered are:

Module 12 Elements of Distance Education (40 hours)

This Module would extend and develop several distance education themes that were touched on in Modules 1 and 2. It would examine areas such as communication with students, student support, frequency of response time, and computers in distance education.

Module 13 Course Evaluation in Distance Education (40 hours)

Module 14 Research and Resource Collection (20 hours)

APPENDIX 6

Outline of the Projects (60 hours)

A number of suggested projects are listed below. These would be completed in a tutor's third year of employment.

1. Write a part of an assignment
2. Set an exam paper
3. Evaluate a course
4. Provide an audio tape
5. Write an in-depth paper on
   - pacing
   - developing audio courses
   - use of electronic media
   - student problems
   - test papers and specimen answers
   - statistical analysis of exam results
   - research based on a questionnaire
   - cost effectiveness
   - laboratory work
   - counselling of students
   - student support